

## ABSTRACT

An approach for improving quality of speech synthesized using analysis-by-synthesis (ABS) coders is presented. An unstable perceptual quality in analysis-by-synthesis type speech coding (e.g. CELP) may occur because the periodicity degree in  
5 a voiced speech signal may vary significantly for different segments of the voiced speech. Thus, the present invention uses a voicing index, which may indicate the periodicity degree of the speech signal, to control and improve ABS type speech coding. The voicing index may be used to improve the quality stability by controlling encoder and/or decoder in: fixed-codebook short-term enhancement including the  
10 spectrum tilt; perceptual weighting filter; sub-fixed codebook determination; LPC interpolation; fixed-codebook pitch enhancement; post-pitch enhancement; noise injection into the high-frequency band at decoder; LTP Sinc window; signal decomposition, etc.